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The Relationship of First Year Experience and Factors Affecting Positive Learning Attitude among Engineering Students

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Abstract

This paper looks into the survey results of first year experience among engineering students who enter university direct from school with the aims of efficiently providing learning programs and instilling generic skills as a supplement to ordinary lectures. Questionnaires were distributed to second year diploma engineering students who have undergone a year of college during the first semester of their second year. The students were required to answer objectively and also encourage writing comments of their first year experience in the university. The responses were studied, analysed further for existing patterns and trends that will contribute to this research. The questionnaire comprises of information pertaining to the university, service and facilities provided to the students, their experience at residential colleges; learning styles, time management, lecture attendance, and own learning progress, self-reflection and activities during the first year. Research findings show that interaction skills and study skills are proven to have a significant influence in the manner respondents' process new information which involves cognitive strategies. Good practice to ensure quality teaching is correlated to intellectual skills, motivation and English language skills. Although lectures are presented in bilingual that is English and Malay, these findings show that written and conversation skills in English are still lacking. More efforts should be given to promote English among students as part of the findings proves that it influences intellectual skills.

Keywords: first year experience; learning; attitude; engineering students

1. Introduction

First year experience is an important factor in enhancing student learning thus affects completion, satisfaction and retention of new students. At the Universiti Teknologi Malaysia, a study is conducted to explore the academic and personal experience of undergraduates during their first year.

Feedback from the survey is analysed to look for the patterns of behaviour and trends concerning learning. A pilot program is planned out to meet the learning environment and support students' learning needs academically with the hope of fostering and creating a positive learning attitude, which is one of the five types of dimensions of thinking (1). Focus of this survey is only at the Kuala Lumpur campus.

2. Background

At the Kuala Lumpur campus there are currently sixteen undergraduate diploma programs of engineering, computing and the humanities. A total of 4,293 students are enrolled into the different courses. Every first semester during the first year, the faculty observe students with good results at the Sijil Pelajaran Malaysia or SPM level fail during the first semester of college. For example first semester, session 2005/2006, fifty four first year students fail to continue university education. For the previous academic year eighty nine students fail their first semester, first year at the university. The university is very concern about the failure rate of these students as some of them perform really well during the SPM. The university has undertaken a step to rectify and study the situation by getting feedback from the second year students who have gone through the first year. This paper looks into the survey results of first year experience among diploma students who enter

university direct from school with the aims of efficiently providing learning programs as a supplement to ordinary lectures. In this way, the university begin to take measures specially design to alleviate the problems in assisting students during their first year. It is hope that these programs provide, foster and create a positive learning attitude towards achieving a university education

3. Academic Initiatives for First Year Experience

The academia around the world are actively involved in activities concerning first year experience either initiative of the country by setting up a special centre, or some universities initiate its own support service centre to address issues of student development. These initiatives are very common in developed countries and many researches are conducted to address the issue (1), (7). But in a developing country like Malaysia, not much research is conducted in this area. Knowing the importance of such feedback, in 2005 Universiti Teknologi Malaysia has embarked on the research of First Year Experience for the first time to ensure quality of its programs and credentials. First year students of diploma in engineering and computing programs enter the university direct from secondary school. Some of these students experience some difficulty in adapting to campus life. The most common problem is the transition from school to the university environment. Transition to university involves adapting to a new academic and social environment.

First year experience research findings show the different pattern, trends and behaviour of students. There are reports in the web in which data are displayed and categorised base on student satisfaction in the first year; academic experience in the first year; student adjustment to college; personal challenges and social networks in the first year; change over the first year of college. (2), (3), (6), (9). For example, findings from “Your First College Year” survey conducted by Higher Education Research Instruments, University of California Los Angeles in 2005 resulted in a total of 38,538 first-time, full-time, first-year students who has responded to the instrument from 144 colleges and universities across the United States (10). Other universities set up a special committee to study on first year experience. Suggestions are recommended for the university to carry out certain measures and policies are drawn to address the issues.

The above findings have one common factor – the need for change in attending to students’ need academically. At this stage first year students need help and guidance. With respect to academic student development, some colleges and universities provide services to students to give guidance on academic matters.

Huot (5) highlights four important pillars of educational reform as a) the introduction of general education courses, b) the integration of generic skills into the program curriculum, c) the development of program standards for each post-secondary program, d) the use of learning outcomes to describe generic skills and vocational goals. She further stresses the emergent of one of the models in the early 1990 which reflect new approaches to teaching and learning – dimensions of learning. It includes approaches that emphasise general education and thinking skills in the curriculum. In this model, successful learning involves thinking which she describes as a complex system of interactions among five types of dimensions of thinking such as a) positive attitudes and perceptions about learning, b) thinking involved in acquiring and integrating knowledge, c) thinking involved in extending and refining knowledge, d) thinking involved in using knowledge meaningfully, and e) productive habits of mind.

Schunk (8) discusses instructional variables and their relationship to learning. He points out that different theoretical perspectives on instruction share certain commonalities such as 1) learners progress through stages or phases, 2) material should be organized and presented in small steps, 3) learners require practice, feedback and review, 4) social models facilitate learning and motivation, 5) motivational and contextual factors influence learning. He explains that two steps are critical in applying the instructional theory involving the conditions of learning, first to specify the type of learning outcome and second, to determine the events of learning or factors that make a difference to instruction. Schunk (8) support Gagné (4) who contended that learning is complex and that learners acquire capabilities that manifest themselves in different outcomes. The five types of learning outcomes are intellectual skills, verbal information, cognitive strategies, motor skills, and attitudes.

4. Measures for First Year Experience

In this survey, the Centre for Teaching and Learning at UTM is responsible for the development of instruments to measure first year experience. Careful thought is given to suit local conditions as culture, beliefs system and the learning environment. The questionnaire consists of ten sections as follows:

1. information regarding the university
2. facilities and services
3. experience at dormitories
4. involvement in campus
5. academic programs
6. learning styles
7. time management
8. attendance in lectures

9. own progress
10. self reflection

- vii. English language skills
- viii. determination

5. Enrolment of Students

The full time undergraduate diploma students at the city campus enter university direct from school base results at the SPM (Sijil Pelajaran Malaysia) level. Currently there are 1244 second year students pursuing different programs in Kuala Lumpur (Table 1). Of these, 934 (75%) students are in the engineering programs such as Diploma in Civil Engineering (DDA); Diploma in Mechatronic Engineering (DDB); Diploma in Computer Science (DDC); Diploma in Electronic Engineering; Diploma in Mechanical Engineering (DDJ); Diploma in Electrical Engineering – Power (DDK); Diploma in Land Surveying; Diploma in Electrical Engineering - Communication (DDP); Diploma in Aeronautical Engineering (DDT) and Diploma in Multimedia (DDZ). The number of students from the non engineering programs such as Diploma in Management Technology; Diploma in Valuation (DDV) and Diploma in Accountancy (DDW) are 310 (25%).

TABLE 1 – Distribution of all second year diploma students according to programs

Programs	Frequency of all second year students	Percentage of all second year students
DDA	132	10.6
DDB	90	7.2
DDC	103	8.3
DDE	87	7.0
DDJ	197	15.8
DDK	57	4.6
DDL	37	3.0
DDP	118	9.5
DDT	34	2.7
DDZ	79	6.4
DDG*	104	8.4
DDV*	108	8.7
DDW*	98	7.9
Total	1244	100.0

Notes: * refer to non-engineering programs

6. Research Methodology

For the purpose of this survey only data pertaining to the information related to learning will be analysed. These factors which resulted in learning are identified in the questionnaire as follows:

- i. Interaction skills
- ii. study skills
- iii. good practice of teaching
- iv. intellectual skill
- v. motivation
- vi. information processing skills

English language skills are measured by English writing skills improve during first year, English conversation skills improve during first year. Intellectual skills is measured by reading skills improve during first year, listening skills improve during first year, intellectual development skills improve during first year, problems solving skills improve during first year. Effective study skills is measured by having problem in identifying on what to study, always able to match up facts with theory, always Identify important topics for lectures, always study on my own the whole first year, prefer to study with friends the whole first year, study for the sake of passing, easy to lose concentration while studying. Motivation is measured by satisfied with the study effort by my friends, put an effort to get excellent results, satisfied with the opportunity to study from friends, satisfied in conducting study session, confidence improve during first year. Good practice of teaching is measured by satisfaction with quality of teaching, the feedback of progress from the lecturer, care by academic advisor and the lecturers' concern of my academic success.

Determination is measured by the statement all first year students studied very hard, well prepared before lecture, and I am determine to get the grades I want. Questionnaires are distributed to second year students who have been through the first year of college. At the end of the questionnaire students are required to write opinions regarding their first year experience. Questionnaires are distributed to the students regardless of their disciplines. The students are required to state their identity card number in the questionnaire. No other information on their background is required. Data mining techniques is applied in this survey. The data for First Year Experience are coded first, the next step is to match these data with the university database obtained from the Centre of Information and Computing Technology (CICT), UTM International Campus, Kuala Lumpur. Matching for this purpose is the process of detecting through the use of national identity card number. This is necessary to further patch up information regarding their names, programs, gender and the current semester results which is not known yet when the FYE was conducted. However the patching up of data cannot be done automatically due to constraints of the different types of software use to store information, the confidentiality of some information and the raw data need to be cleaned before analysing for results. At this point there are variables or items in the questionnaire that need to be recoded.

For the early part of the analysis, the mean and standard deviation for the factors which result in learning between the engineering and non

engineering programs are monitored to check for the reliability and validity of the survey questions. When the results show consistency between the two groups determine by the standard deviation and the mean, then the next step of analysis is allowable. Second, this is also an indication that common programs for students development can be planned out regardless of the disciplines of study. Third, this indicator permits organizers to perform group task regardless of their academic background especially when conducting a student development programs.

7. Research Findings

The profile of the respondents are shown in Table 2, Table 3 and Table 3 respectively. A total of 191 students responded to the survey. Table 1 shows frequency according to programs DDA (17, 8.9%); DDB (5, 2.6%); DDC (9, 4.7%); DDE (16, 8.4%); DDG (21, 11.0%); DDJ (16, 8.4%); DDK (8, 4.2%); DDL (4, 2.1%), DDP (11, 5.8%); DDT (3, 1.6%); DDV (14, 7.3%); DDW (27, 14.1%); DDZ (7, 3.7%) and those who do not respond (33, 17.3%).

TABLE 2 – Program of the respondents

Detail Programs	Frequency	Percent
DDA	17	8.9
DDB	5	2.6
DDC	9	4.7
DDE	16	8.4
DDG	21	11.0
DDJ	16	8.4
DDK	8	4.2
DDL	4	2.1
DDP	11	5.8
DDT	3	1.6
DDV	14	7.3
DDW	27	14.1
DDZ	7	3.7
missing	33	17.3
Total	191	100.0

Table 3 shows 96 (50.3%) respondents are from the engineering program and 62 (32.5%) respondents are from the non engineering programs.

TABLE 3 – Distribution of the programs

Programs of respondents	Frequency	Percent
engineering program	96	50.3
non-engineering program	62	32.5
Total	158	82.7
System missing	33	17.3
Total	191	100.0

In Table 4, 32.5% of the respondents are males and 62.3% are females. The current semester results shown by Cumulative Point Average (CPA) indicate

6.3% obtained lower than a 1.99; 24.1% at CPA of 2.00-2.49; 36.1% at 2.50-2.99; and 16.2% at 3.00-3.49.

TABLE 4 – Distribution by gender and Cumulative Point Average

Background of respondents		Frequency	Percent
Gender	male	62	32.5
	female	119	62.3
	Total	181	94.8
Missing	System	10	5.2
Total		191	100.0
Cumulative Point Average	lowest to 1.99	12	6.3
	2.00 to 2.49	46	24.1
	2.50 to 2.99	69	36.1
	3.00 to 3.49	31	16.2
	Total	158	82.7
Missing	System	33	17.3
Total		191	100.0

Table 5 is a list of factors that prevail when learning occurs. The factors are Interaction skills, study skills, good practice of teaching, intellectual skills, motivation, information processing skills, English language skills and determination by programs. The statistics show differences according to mean and standard deviation of the factors between engineering and non engineering programs. It is concluded that the results are similar between the two groups.

TABLE 5 – Mean and standard deviation of factors between engineering and non engineering

Factors	engineering program			non-engineering program		
	Mean	N	Std. Deviation	Mean	N	Std. Deviation
Interaction skills	2.1720	93	.37946	2.1207	58	.32861
study skills	1.9778	90	.14823	2.0000	60	.00000
good practice of teaching	2.7204	93	.45122	2.8033	61	.40082
intellectual skill	1.9247	93	.26525	2.0000	58	.00000
motivation	2.3763	93	.50892	2.3500	60	.48099
information processing skills	1.7553	94	.47939	1.8500	60	.36008
English language skills	1.6915	94	.46436	1.8000	60	.40338
determination	2.2447	94	.43220	2.3115	61	.46694

Table 6 examines the factors that are identified to be significantly correlated to each other during the analysis. The correlation coefficients shown in the table are weak nevertheless the results provide a useful index to the strength of relation between two

factors which are significant. The factors (variables) that are positively correlated and significant at 0.05 confidence level are as follows:

- i. Interaction vs. information processing skills ($\rho = 0.207^*$, $0.005 < 0.05$)
- ii. Study skills vs. information processing skills ($\rho = 0.190^*$, $0.011 < 0.05$)
- iii. Study skills vs. determination ($\rho = 0.171^*$, $0.022 < 0.05$)
- iv. Good practice of teaching vs. intellectual skills ($\rho = 0.265^*$, $0.000 < 0.05$)
- v. Good practice of teaching vs. motivation ($\rho = 0.282^*$, $0.000 < 0.05$)
- vi. Good practice of teaching vs. English language skills ($\rho = 0.285^*$, $0.000 < 0.05$)
- vii. Intellectual skills vs. English language skills ($\rho = 0.212^*$, $0.004 < 0.05$)
- viii. Motivation vs. determination ($\rho = 0.180^*$, $0.015 < 0.05$)

TABLE 6 - Factors that are significantly correlated at the 0.05 level (2-tailed)

Variables	N	Pearson Correlation (ρ)	Sig.
Interaction vs. information processing skills	178	.207(*)	.005
Study skills vs. information processing skills	178	.190(*)	.011
Study skills vs. determination	179	.171(*)	.022
Good practice of teaching vs. intellectual skills	178	.265(*)	.000
Good practice of teaching vs. motivation	180	.282(*)	.000
Good practice of teaching vs. English language skills	181	.285(*)	.000
Intellectual skills vs. English language skills	178	.212(*)	.004
Motivation vs. determination	181	.180(*)	.015

* Correlation is significant at the 0.05 level (2-tailed).

8. Discussion and Conclusion

Interaction skills and study skills are proven to have a significant influence in the manner respondents' process new information which involves cognitive strategies. According to Schunk (8) information processing skills include how the

respondents attend to new information, deciding to rehearse information, elaborating, and using long-term memory retrieval strategies. Study skills too have an effect on determination and vice versa. Therefore study skills such as has problem in identifying on what to study, ability to match up facts with theory, able to identify important topics for lectures, always study on his/her own the whole first year, prefer to study with friends the whole first year, study for the sake of passing, easy to lose concentration while studying should be given utmost attention. Good practice to ensure quality teaching is correlated to intellectual skills, motivation and English language skills. This is an indication that the respondents' level of satisfaction with quality of teaching, prompt feedback of learning progress from the lecturer, care by academic advisor and the lecturers' concern of academic success of the respondents play a big role in promoting learning. Although lectures are presented in bilingual that is English and Malay, this findings show that written and conversation skills in English are still lacking. More effort should be given to promoting English among students as this finding prove that it influence intellectual skills. This is true as most reference books use in higher education in the country are in English.

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